HARVARD UNIVERSITY
SCHOOLS OF MEDICINE AND PUBLIC HEALTH
LIBRARY

$1.00 PER YEAR 25 CTS. PER COPY

SEP 14 1949

JOURNAL

OF THE

MASSACHUSETTS ASSOCIATION

OF

BOARDS OF HEALTH

An Official Quarterly Record of
Information for the Public

JANUARY, 1901

Proceedings of the October Quarterly Meeting

Subjects: The Swab Method in Rapid Diagnosis of Diphtheria — Glanders — The Necessity for More Thorough Inspection of Sanitary Conditions in Massachusetts

BOSTON
SMALL, MAYNARD & COMPANY
Pierce Building, Copley Square

VOLUME X NUMBER 4

Entered at the Post-office at Boston, as Second-class Matter

DUSTALAYER

(TRADE-MARK)

NO MORE DUST — NO MORE DIRTY FLOORS

A labor saver and health preserver.
It has all the good qualities of a

Transparent Wax Floor Dressing

BUT IS FAR SUPERIOR.

Inexpensive, Durable, Easily Applied, Dries Quickly and is Non-combustible.

Its use saves money as it does away with all expense of scrubbing, sprinkling, dusting and all injury to furniture, fabrics, etc., caused by dust.

A GALLON WILL COVER FROM 300 TO 500 SQUARE FEET.

DIRECTIONS:—Shake the can before using, and apply with a brush, always with the grain of the wood where possible. Brush down evenly when it will dry quickly. It is always better to go over the floor with a dry cloth in a mop-stick, rubbing across the grain. Have the floor thoroughly scrubbed and dry before applying. Afterwards use no soap or lye for cleaning. You can, if you like, mop it over with plain water, but this is not necessary. Sweeping with a good corn broom is sufficient, and the more thoroughly this is done the better. As it begins to show wear, touch it up lightly on parts worn with DUSTALAYER, and you will find, with the above treatment, that the appearance of your floor is improving from month to month, and from year to year.

N. E. DUSTALAYER CO.,

ROOMS 72, 73 & 74.

620 ATLANTIC AVENUE,
(Opposite South Station)

Telephone,
Boston, 4142.

BOSTON, MASS.

Cabot's Sulpho-Naphthol.

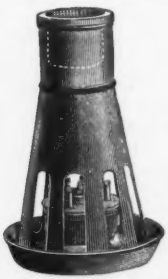
NON-CORROSIVE, NON-POISONOUS BACTERICIDE, GERMICIDE, ANTISEPTIC DEODORANT, DISINFECTANT.

One gallon makes two hundred of solution that will immediately arrest decomposition. A few gallons thrown into a vault or cesspool, and the contents can be removed without any odor.

Correspondence Solicited. Results Guaranteed.

The Sulpho-Naphthol Company,

687 Washington Street, Boston, Mass.



Schering's Formalin Disinfector.

Unsurpassed in Effectiveness and Simplicity.
Absolutely Safe and Inexpensive.

Schering's method of disinfection is approved and recommended by the very highest authorities, both in Europe and the United States. Among its many advocates we mention:

PROFESSOR C. FLÜGGE, of Breslau, Medical Privy Councillor and Member of the Imperial German Health Department.
PROFESSOR H. BUCHNER, of the Hygienic Institute of the University of Munich.
PROFESSOR RUDOLF KOBERT, late Director of the Brehmer Sanatorium for Consumptives, Goerbersdorf, Silesia.
HENRY KENWOOD, M.B., D.PH., F.C.S., Assistant Professor of Public Health, University College, London; Medical Officer of Health, Stoke Newington, and
DR. CHARLES HARRINGTON, Instructor in Hygiene and Materia Medica at the Harvard Medical College, Boston.

SCHERING'S FORMALIN DISINFECTANT AND DEODORIZING LAMP.

A most energetic disinfector and destroyer of foul and decomposing odors.
An absolutely reliable agent for air purification and sterilization.
Far more efficacious and pleasant than sulphur, carbolic acid, cresolene, etc.
The most efficient destroyer of the disease-producing micro-organisms.
Invaluable in the treatment and prevention of diphtheria, scarlet fever, measles, whooping-cough, etc.
Does not injure furniture, fabrics, or material of any kind.
When the vapors of Formalin are employed in the treatment of zymotic diseases or for ordinary air purification and sterilization, one pastil should be constantly evaporated in the upper cup of the lamp. When rapid vaporization is required, the upper cup should be removed and the pastils placed directly in the lower receptacle.

SCHERING & GLATZ,
58 MAIDEN LANE, NEW YORK.

Literature furnished on application.

Members Massachusetts Association of Boards of Health.

OFFICERS FOR 1900.

President, HENRY P. WALCOTT, M.D.

Vice-Presidents, S. H. DURGIN, M.D., S. W. ABBOTT, M.D.

Treasurer, JAMES B. FIELD, M.D. *Secretary*, EDWIN FARNHAM, M.D.

Executive Committee, W. H. CHAPIN, M.D., J. A. GAGE, M.D., THOS. W. COOK, H. L. CHASE, M.D., W. P. BOWERS, M.D., W. Y. FOX, M.D., J. C. COFFEY, G. L. TOBEY, M.D., W. H. GOVE, R. L. NEWCOMB.

Allston.

Howard P. Rogers, D.V.M.

Andover.

Charles E. Abbott, M.D.

Belmont.

W. Lyman Underwood.
H. A. Yenetchi, M.D.

Boston.

Silas H. Ayer, M.D.
David D. Brough, M.D.
Alexander Burr, D.V.S.
J. W. Cosden.
B. F. Davenport, M.D.
F. W. Draper, M.D.
S. H. Durgin, M.D.
Harold C. Ernst, M.D.
Charles Harrington, M.D.
W. L. Hicks.
Hibbert W. Hill, M.D.
C. H. Hood,
Everett D. Hooper, M.D.
L. H. Howard, D.V.S.
Thomas Jordan.
W. G. Macdonald, M.D.
Horace E. Marion, M.D.
Laurens Maynard.
W. H. Mitchell.
F. L. Morse, M.D.
Austin Peters, D.V.S.
E. L. Pilsbury.
William H. Prescott, M.D.
George E. Sedgwick.
Prof. W. T. Sedgwick.
Thomas B. Shea, M.D.
Herbert Small.
Theobald Smith, M.D.
I. H. Stickney, M.D.
George M. Whitaker.

Brighton.

Otis H. Marion, M.D.
Henry G. Rowen, M.D.

Brockton.

Charles H. Cary.
F. J. Ripley, M.D.
L. F. Severence.
F. Herbert Snow, C.E.
R. S. Weston.

Brookline.

H. L. Chase, M.D.
James M. Codman, Jr.
Francis P. Denny, M.D.
F. H. Osgood, M.R.C.V.S.
John K. Whiting.

Cambridge.

Lewis L. Bryant, M.D.
E. R. Cogswell, M.D.
John Crawford.
E. A. Darling, M.D.
Edwin Farnham, M.D.
George W. Fitz, M.D.
Charles Harris.
Thos. Hunt.
E. E. Spencer, M.D.
H. P. Walcott, M.D.

Chelsea.

H. A. Sibley, M.D.

Clinton.

W. P. Bowers, M.D.
C. L. French, M.D.
J. J. Goodwin, M.D.
Frank T. Harvey, M.D.
George J. Ott, M.D.
George L. Tobey, M.D.
John F. Worcester, M.D.

Cohasset.

Joseph S. Bigelow.
Oliver H. Howe, M.D.

Concord.

John M. Keyes.
Thomas Todd.

Dedham.

E. W. Finn, M.D.

Duxbury.

N. K. Noyes, M.D.

Everett.

E. Cazneau Newton, M.D.
Frank W. Sawyer, M.D.
N. B. Smith.
E. W. Young, M.D.

Fall River.

A. W. Buck, M.D.
Arthur I. Connell, M.D.
John Gilbert.
Charles A. Hicks, M.D.
Archibald St. George, M.D.

Falmouth.

Russell S. Nye.
Asa R. Pattee.

Fitchburg.

J. F. Bresnahan.
E. L. Fisk, M.D.
John D. Kielty, M.D.
Chester L. Lincoln.
Atherton P. Mason, M.D.
Chas. H. Rice, M.D.
David W. Tinsley.
D. S. Woodworth, M.D.

Framingham.

N. I. Bowditch.

Gardner.

E. A. Sawyer, M.D.

Gloucester.

H. L. Belden.

Greenfield.

H. G. Stetson, M.D.

Haverhill.

John F. Croston, M.D.
J. M. Parker.

Hyde Park.
Willard S. Everett, M.D.
Edwin C. Farwell.
William W. Scott.

Lancaster.
Allen G. Butterick.
H. M. Nash, M.D.
F. A. Willard.

Lawrence.
George S. Fuller, D.V.S.
F. W. Kennedy, M.D.
Fred H. Schaake, M.D.
George W. Smith.
Emil C. Stiegler.
J. F. Winchester, M.D.

Leominster.
C. E. Bigelow, M.D.
H. N. Spring.
A. L. Whitney.

Lexington.
George O. Whiting.

Lowell.
James Bayles.
William F. Curtin.
James B. Field, M.D.
J. Arthur Gage, M.D.
Thomas F. Harrington, M.D.
W. P. Lawler, M.D.
Thomas B. Smith, M.D.

Malden.
Frank H. Parker, M.D.

Marlboro.
F. F. McCarthy, M.D.
William S. Richardson, M.D.

Melrose.
Corydon W. Harlow, M.D.
J. E. Sanborn, M.D.

Milton.
Thomas K. Cummings.
H. P. Jaques, M.D.
Walter C. Kite, M.D.
Thomas N. Perkins.
C. Minot Weld.

Needham.
A. E. Miller, M.D.
A. M. Miller, M.D.

New Bedford.
D. C. Ashley, M.D.
J. T. Bullard, M.D.
Thomas W. Cook.
Edgar H. Gammons.
W. S. Kirschbaum.
Louis H. Richardson.
Manual V. Sylvia, M.D.
Edwin E. Waite, M.D.

Newton.
J. C. Brimblecom.
Francis G. Curtis, M.D.
George H. Ellis.
W. F. Harbach.
Arthur Hudson.
Henry A. Stone.
E. R. Utley, M.D.

New York City.
Col. W. F. Morse.

North Andover.
Charles P. Morrill, M.D.

North Brookfield.
T. J. Garrigan, M.D.

Norwood.
Eben C. Norton, M.D.

Pepperell.
C. A. Dennen.

Plymouth.
W. G. Brown, M.D.

Providence, R.I.
Ernest T. Badger.
C. V. Chapin, M.D.
F. P. Gorham, M.D.
Gardner T. Swarts, M.D.

Rockland.
Gilman Osgood, M.D.

Salem.
G. Arthur Bodwell.
Daniel Rollins Brown, M.D.
Charles B. Fowler.
W. H. Fuliam.
W. H. Gove.
George G. Hathaway
David M. Little.
George W. McIntire.
Raymond L. Newcomb.
George A. Newhall.
Chas. H. Phippen.
Jesse Robbins, M.D.
William O. Safford.
A. N. Sargent, M.D.
G. A. D. Stickney.
David P. Waters.

Somerville.
Robert Burns.
W. F. Holmes, M.D.
A. E. Merrill, M.D.
George Whiting.

South Framingham.
L. M. Palmer, M.D.
W. N. Sharp, M.D.

Springfield.
W. H. Chapin, M.D.
Herbert C. Emerson, M.D.
James Kimball.
B. D. Pierce, D.V.S.

Taunton.
W. Y. Fox, M.D.
Charles H. Macomber.
T. J. Robinson, M.D.
Elliott Washburn, M.D.
Henry H. Wilcox.

Turner's Falls.
P. F. Leary, M.D.

Wakefield.
S. W. Abbott, M.D.

Ware.
A. A. Etienne, D.V.S.

Waltham.
H. D. Chadwick, M.D.
Marshall J. Mosher, M.D.
E. Irving Smith.
Charles A. Willis, M.D.

Watertown.
Vivian Daniel, M.D.
Julian A. Mead, M.D.

Waverley.
L. B. Clark, M.D.

Wellesley.
Edward Bancroft, M.D.

Westboro.
Francis E. Corey, M.D.
C. S. Henry.

Westfield.
James W. Holland, M.D.

Weston.
George Abercrombie.
H. L. Cooper.
B. H. Dickson, Jr.
F. W. Jackson, M.D.

Whitman.
C. E. Lovell, M.D.

Winchendon.
F. W. Russell, M.D.

Winthrop.
A. B. Dorman, M.D.
Horace J. Soule, M.D.

Woburn.
George Buchanan.
James H. Conway, M.D.
B. Frank Waldron.

Worcester.
F. H. Baker, M.D.
George E. Batchelder.
George W. Batchelder.
W. T. Clark, M.D.
James C. Coffey.
Prof. L. P. Kinnicutt.
J. F. McCartney.
L. F. Woodward, M.D.

Nobscot Mountain Spring Water

"Water-shed heavily wooded except directly above spring, where two or three acres have been cleared. No houses on water-shed."

Massachusetts State Board of Health.

GRAINS PER U. S. GALLON.

Residue on Evaporation,	2.50
Free Ammonia,	.0000
Albuminoid,	.0003
Nitrates,	.0000
Nitrites,	.0000
Hardness,	1.32

One of the purest waters we have ever analyzed.

(Signed) **Prof. C. F. Chandler,**
Columbia School of Mines, 1895.

PARTS PER 100,000.

Residue on Evaporation,	3.55
Free Ammonia,	.0004
Albuminoid Ammonia,	.0000
Nitrates,	.0000
Nitrites,	.0000
Hardness,	1.80

Massachusetts State Board of Health Report, 1891.

GRAINS PER U. S. GALLON.

Total Solids,	3.21
Consisting of	
Organic and Volatile Matter,	.64
Mineral Solids,	2.57
Consisting of	
Silica,	.53
Iron Oxide and Alumina,	.02
Carbonate of Lime,	.75
Carbonate of Magnesia,	.23
Sodium Chloride,	.36
Sodium Carbonate,	.38
Sulphate of Potash,	.30
	2.57

These results show this water to be one of unusual purity, and its use as a drinking water can therefore in every way be recommended.

(Signed) **Davenport & Williams,**
Boston, 1891.

Send for booklet and price list,

Tel. 3596. **62 CONGRESS STREET, BOSTON.**

The attention of **Boards of Health** is invited to

NEUCHATEL

ROCK ASPHALT FLOORS

For Hospitals, Water-closets, Stables, Laundries, Basements, Kitchens, Dwelling-house Cellars, Breweries, Manufactories, Warehouses, Courtyards, Walks, Driveways, etc.

ADVANTAGES:

They are Smooth, Hard, Dry, Fire-proof, Odorless, Non-absorbent, free from mould or dust, impervious to sewer gases, and for sanitary purposes invaluable.

Estimates for cheaper Asphalt furnished, if desired.

All Kinds of Artificial Stone Work.

SIMPSON BROTHERS CORPORATION,

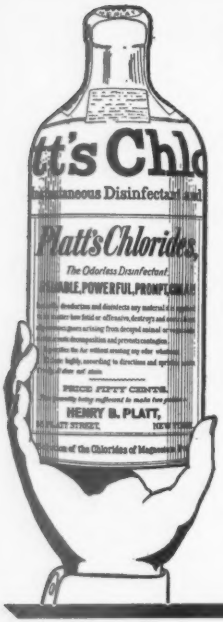
166 Devonshire Street (Room 58), ... BOSTON.

Telephone 1155.

JOURNAL OF THE MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH

October Meeting, 1900

SUBJECTS: The Swab Method in Rapid Diagnosis of Diphtheria — Glanders — The Necessity for More Thorough Inspection of Sanitary Conditions in Massachusetts



Rely upon Platt's Chlorides

as your sick-room disinfectant.

"Platt's Chlorides disinfects and deodorizes decomposing matter and excreta by the destruction of disease germs, and by chemically neutralizing hydrogen sulphide, skatol, and ammoniacal bases."

It is an odorless, colorless liquid; powerful, safe, and cheap. Sold in quart bottles only, at fifty cents, by druggists everywhere. A quart makes two gallons sufficiently strong for general use. Prepared only by HENRY B. PLATT, Platt Street, New York.

THE JOURNAL OF THE MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.

THE MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH was organized in Boston in March, 1890, with the following objects: the advancement of sanitary science in the Commonwealth of Massachusetts; the promotion of better organization and co-operation in the local Boards of Health; the uniform enforcement of sanitary laws and regulations; and the establishment of pleasant social relations among the members of the Association.

All persons holding appointments as members of a Board of Health in a Massachusetts city or town, the executive officers of such a local board, and the members of the State Board of Health are eligible to membership. Other persons may be elected members by vote of the Association. The annual dues are one dollar and fifty cents, and should be paid to the Treasurer, James B. Field, M.D., 329 Westford Street, Lowell, Mass.

The Association holds four regular meetings each year, the annual or January meeting always being held in Boston.

THE OFFICIAL JOURNAL OF THE ASSOCIATION is a quarterly publication, containing the papers read at the meetings, together with verbatim reports of the discussions following them.

All communications to the Association should be addressed to the Secretary, **EDWIN FARNHAM, M.D., City Hall, Cambridge, Mass.**

Subscriptions and all business communications should be sent directly to the publishers,

SMALL, MAYNARD & COMPANY,
Pierce Building, Copley Square, Boston.

JOURNAL OF THE

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.

ORGANIZED 1890.

[The Association as a body is not responsible for statements or opinions of any of its members.]

VOL. X. January, 1901. No. 4.

OCTOBER MEETING

OF THE

Massachusetts Association of Boards of Health.

The October quarterly meeting of the Association was held at "The Johnsonia," Fitchburg, on the afternoon of Oct. 18, 1900. A banquet, complimentary to the Association, was furnished by the municipal government of Fitchburg. Just before the close of the banquet Dr. Walcott, who presided, called the assembly to order, and spoke as follows: —

THE PRESIDENT. — Gentlemen of the Association, it is rather necessary that we should begin; and, fortunately, the beginning is not going to be one of that sort which will disagree with your food or the taking of it. His Honor, the Acting Mayor of Fitchburg, will say a few words to the Association. I have the pleasure of introducing him to you, — Mr. George H. Priest. [Applause.]

MR. PRIEST. — Mr. President and members of the Association, I stand here, in the absence of Mayor Anderson, to give you a brief word of greeting at this time. I consider it an honor that Fitchburg should entertain within her gates such a representative body of men as I see before me. Fitchburg does welcome you at this time; and

we trust that, before you get through your meeting and finish your business, you may settle for us the vexed question of our new sewage plant. Our local Board of Health wants to know something about that, I believe; and I see also a couple of members of the Commission here who would be greatly pleased to have the question decided for them. [Applause.]

Owing to the lack of time, the reading of the records of the last meeting was dispensed with.

THE PRESIDENT.— Is the special committee on "Diphtheria Bacilli in Healthy Throats," of which Dr. Chapin is chairman, prepared to report at this time?

DR. CHAPIN, Providence.— Mr. President, if I remember right, our committee was to report at this meeting; but, unfortunately, we found that we needed to spend a great deal of time in collecting data in regard to the presence of diphtheria bacilli in the throats of the well. Dr. Hill, the secretary of the committee, has been very busily engaged in this work. He sent out letters of inquiry, 192 in all, of which 134 were sent to cities, 39 to State Boards of Health, and 19 to hospitals. Replies have been received from 74. These schedules of inquiries which were sent out were quite elaborate, and the labor of tabulating the replies is very considerable. As all of the replies that we expect have not yet been received, it was found impossible to have a meeting and discuss the question as fully as it should be discussed. Hence we are not able to report to-day, except to report progress. If it is your pleasure to continue the committee to the next meeting, we hope to be able to present a final report at that time.

THE PRESIDENT.— Shall your committee have further time? If there is no objection, it will be so understood. There is a piece of delayed business which I shall have to apologize for not presenting first, and that is the report of your Executive Committee. The Executive Committee report for recommendation for election to membership in the Association the following names: —

J. N. Marston, M.D.	Lowell.
B. R. Richards	Boston.
J. P. Schneider, M.D.	Palmer.
J. Sanford Orr, M.D.	Weston.
Clarence P. Holden	Melrose.
William H. Dole	Melrose.
Paul H. Provandie, M.D.	Melrose.
C. E. A. Winslow	Boston.
Arthur B. Wetherell, M.D.	Holyoke.
Frank A. Woods, M.D.	Holyoke.
T. J. Linehan	Holyoke.

The above-named gentlemen were elected members of the Association.

The President.— The first paper on the programme is on "The Results of One Year's Use of the Swab Method in Rapid Diagnosis of Diphtheria," by Dr. Atherton P. Mason, of the Fitchburg Board of Health.

THE RESULTS OF ONE YEAR'S USE OF THE SWAB METHOD IN THE RAPID DIAGNOSIS OF DIPHTHERIA.

BY ATHERTON P. MASON, M.D., BACTERIOLOGIST OF THE FITCHBURG BOARD OF HEALTH.

At the meeting of this Association held a year ago, at Leominster, Dr. H. W. Hill read a paper on "Rapid Diagnosis of Diphtheria by Direct Swab Examinations," which was of great interest to me. I had already tried the method in a small way; but, not being able to tell, with sufficient degree of certainty whether the swab cultures contained diphtheria bacilli or not, I had not found it entirely satisfactory. Dr. Hill's paper, however, cleared up several doubtful points and gave me renewed courage; and on Nov. 1, 1899, I put the method into use here in Fitchburg, and have continued it since that date with fairly satisfactory results.

Preliminary to this paper, which will be but a brief summary of cases in which the swab was used for diagnosis, and some remarks

on certain points connected therewith, I desire to say a few words as to my method of procedure. In the first place my copper boxes differ slightly from any others I have seen, and were made from my own design, by Mr. Peter Gray, of Boston, and have proved excellently adapted to this method of diagnosis. Each box is $6\frac{3}{4}$ inches long, 2 inches wide, and 1 inch deep, and is divided into two compartments by a partition, $\frac{1}{3}$ of an inch thick, having a groove on the top. This partition does not run the whole length of the box, but stops about an inch from the top end, thus giving abundant room for the flanges of the test-tubes. Each box fits into an ordinary copper case. When the box goes out for a diagnosis case, it contains the following: a tube of serum in one compartment, a swab tube in the other, and a platinum wire in its holder in the groove on the partition. With the paper for data of the case is put a slip, asking the physician to first take a wire culture on the serum and then rub the swab over the affected part and replace in the tube for rapid diagnosis. The box is sent to me as soon as may be after the culture is taken, the serum tube put into the incubator, and the swab immediately examined and reported on. I am a firm believer in wire cultures; and my box allows of having the serum culture taken once for all in that way, and leaves the swab culture to be used *solely* for immediate examination. This is the second point of difference between the ordinary mode of procedure and mine, and it seems to me to enhance the chances of correct diagnosis from the swab. If the swab seems unquestionably positive at the first examination, that suffices; but, if the first preparation from the swab is negative or doubtful, I make another, and, if necessary, a third or even fourth preparation before deciding. The wisdom of doing so was shown me in two cases during the past year, to be spoken of later, in which, being pressed for time, I relied on *one* preparation from the swab.

From Nov. 1, 1899, to Oct. 15, 1900, 126 primary serum cultures were examined at my laboratory. Of these, 14 were primary in the sense that they were the first cultures sent me from the cases, but were ostensibly for release, no culture having been taken at the beginning of the cases. These were, of course, unaccompanied by a swab. There were also 13 cases for diagnosis in which no swab was used. Eliminating these 27 cases, we have 99 cultures from 97

persons (in 2 cases cultures from both throat and nose being taken from each patient), in which both swab and serum cultures were sent in. These 99 cultures, therefore, form the basis of this paper; and the following summary gives the result of my examination of them as reported to the Board of Health: —

	Cultures.	*Cases.*
Swab and serum both positive	37	35
Swab and serum both negative	34	34
Swab negative, serum positive	10	10
Swab positive, serum negative	3	3
Swab doubtful, serum positive	7	7
Swab doubtful, serum negative	6	6
Swab doubtful, serum no growth	2	2
Total	99	97

This shows that in 71 cultures out of 99, the swab and serum agreed, being 71.7 per cent.; in 13 cultures there was total disagreement between swab and serum, 13.1 per cent.; while the remaining 15 swabs were doubtful, the serum cultures proving positive and negative about equally. These figures are interesting; but, as negative swabs are unreliable, the only point of really practical value to us is the proportion of positive cases diagnosticated from the swab. 54 of these serum cultures proved positive; and of these 37 were positive by swab, being 68.7 per cent. In cases of positive or doubtful swab, where serum is negative or shows no growth, it is my habit to ask for a second culture. The request has been complied with in 6 of the 18 cases of the kind that have occurred during the past year. In 2 of these second cultures no swab was used; and the only important change shown by the remaining 4 was in a case of swab positive, serum negative, the second culture showing both positive. This adds one more to the number of positive cases diagnosticated from the swab, making 38 out of 54,— just 70 per cent.

In several cases of negative or doubtful swab, where the serum culture showed comparatively few bacilli,— and those largely obscured by growth of other organisms, so that it was impossible to be absolutely sure, by ordinary staining, that they were diphtheria bacilli,— I have found Hunt's stain very valuable. It takes but a few minutes to do it, and generally settles the question decisively; while a plate culture or second culture from the patient would require some hours.

The results of the use of the swab the past year are more accurate than was anticipated, and can, it seems to me, be reasonably attributed solely to the fact that the swab may be used for making two or three preparations, if necessary. I alluded earlier in this paper to 2 cases where I reported a negative swab after examining only one preparation from it. A few hours later I examined the preparation again with the same result. Then, in accordance with my custom, I made a second preparation in each case (the 2 cases were not at the same time, but several months apart); and examination in each instance showed positive evidence of diphtheria bacilli, so I had to reverse my decision. The serum cultures proved positive later in each of these cases. Had I delayed reporting for a few hours, these 2 would have increased the number of positive cases diagnosticated from the swab to 40 out of 54,— 74 per cent.

I very much regret my inability to furnish comparisons between swab diagnosis and regular five and fifteen hour incubation of serum cultures. Being able to devote only a portion of my time to bacteriological work, I find it impossible to carry out this method. Serum cultures that come in during the day or evening are always examined on the morning of the following day, the period of incubation ranging from twelve to twenty hours.

There is one interesting fact which I desire to mention, as it is in the line of the report of the committee just read by Dr. Chapin. 15 of the above enumerated cases of swab and serum cultures were taken from persons not ill, but whose throats were examined because of either having been exposed to diphtheria or being suspected of having bacilli and causing contagion. Of the 15 swabs used, 12 were negative, 2 positive, and 1 doubtful. 5 of the serum cultures proved positive. One of these positive cases was that of a travelling salesman, and he was immediately quarantined on the swab diagnosis. Here is where the value of this method, if due care and experience are associated with its use, is most plainly shown; for it renders possible a very early isolation of the case, and very much decreases the chances of allowing the spread of the disease to others. One case in particular I recall which occurred last January. A man, who kept a grocery store on the lower floor of a tenement house occupied by something like one hundred persons, was taken ill, and sent

for a physician. There were no special throat symptoms, and the physician was not particularly suspicious of its being diphtheria; but, under the circumstances, he deemed it prudent to take a culture and send it to me for examination. I found the swab unquestionably positive, and the case was quarantined immediately. Sometimes, however, I have found out, to my own discomfiture, it is not safe to quarantine on the swab. In 2 cases I made an egregious blunder with the swab, calling it positive when the serum cultures persistently in first and second instances failed to show anything but a miserable streptococcus growth.

Undoubtedly, work of this kind — which is at the present time, to me at least, in a large degree experimental — is open to criticism and improvement. Lack of experience has, as might be expected, caused me to make some mistakes; and I have made this paper as brief as possible, so that there may be more time for discussion of the subject by those who have a wider experience.

It would seem, however, that, if physicians and bacteriologists worked together in perfect accord, and strove to carry out this method carefully, extremely few cases of diphtheria would escape detection. The only loophole in the system as carried on at present is where swab and serum are both negative and no further cultures made.

The success or failure of bacteriological work depends a great deal on the care, intelligence, and interest shown by the physicians who obtain material for examination; and, in closing this paper, I desire to thank the physicians who, by putting themselves to the trouble of taking swab cultures for diagnosis, have enabled me to prosecute this investigation, and hope that the results attained may be sufficiently valuable to insure a continuance of this method.

THE PRESIDENT.— The next paper on the programme is on "Glanders," by Dr. Alexander Burr, of Boston.

GLANDERS.

BY DR. ALEXANDER BURR.

Mr. President and Gentlemen,— While it is true that the municipal boards of health of this State, with the exception of the Boston Board of Health, have at present nothing to do officially with glanders in horses, the method of the diagnosis of glanders is a subject of some scientific and practical interest to this Association, especially in view of the occasional occurrence of this disease in man.

This disease is known in animals as glanders and farcy. They are one and the same disease, due to the same organism. The term "glanders" is applied to this disease when the external lesions are present in the nasal mucous membrane and adjacent lymphatic glands, as the submaxillary gland. The term "farcy" is applied to this disease when the external lesions appear as ulcers in the skin, accompanied by a nodular condition of the superficial lymphatics. The existence of the two terms, "glanders" and "farcy," is misleading, since they are often considered to mean two distinct diseases. It is much better to speak of the disease as glanders, without regard to location. That they are one and the same disease there can be no doubt, as the bacillus mallei is the cause of both. Experimentation has demonstrated that inoculation from glanders may produce farcy, or glanders; and the same is true of farcy.

Glanders occurs clinically in horses, mules, and asses. It occurs in man probably by transmission from animals affected with glanders. Cattle appear to be immune.

The mode of infection is probably by direct contact, as from a diseased animal, or places and articles which have become infected by glandered animals, as harnesses, stable fittings, cleaning instruments, watering-troughs, hitching-posts, etc. It gains entrance ordinarily through an abrasion on the nasal mucous membrane or the skin, possibly through the digestive system.

Glanders occurs in animals as an acute or chronic disease. The usual form seen is the chronic.

In acute glanders there is marked constitutional and functional disturbance, with intense fever, often running as high as 105 or 106 degrees, which lasts for a number of days. There is rapid emaciation, frequent chills, and perhaps lameness without any apparent cause, followed by œdema of the extremities. While in this stage, which lasts two to four days, the diagnosis is very difficult to make. Soon the fever begins to diminish, followed by local lesions. Glanders nodules appear on the nasal septum, which rapidly soften, causing more or less discharge, and leaving a deep, ragged edge ulcer. The disease in a short time becomes general in the lungs and lymphatic glands, with intense inflammation of the synovial membranes of the joints. Fever now begins to increase again, cheesy deposits in the lungs become extensive, and death follows, in from one to two weeks.

Chronic glanders probably always begins with a slight acute attack of glanders, which is not recognized as such, probably being diagnosed as a slight coryza, or an attack of lymphangitis. In fact, the history often obtained in chronic glanders is that the animal has had a number of attacks of lymphangitis, which readily yielded to treatment, the horse returning to work and continuing for some time in good condition.

Chronic glanders may continue for months and even years before definite symptoms, such as typical ulcerations of the mucous membrane of the nose or the subcutaneous tissues, appear to warrant one in making a positive diagnosis. I have known a case, from the history given at the time of examination, to have been as long as two years in duration. On Tuesday of this week I held an autopsy on a horse which I have had under observation for over a year. It was one of a four-horse team, its mate — that is, the horse which worked side of it — and one other horse having been killed as cases of glanders. Upon examination of the entire stable this horse — a fine, large 1,600 pound animal, in apparently perfect health — showed a slightly enlarged submaxillary gland, together with a slight mucous discharge from one nostril. Although the symptoms shown were not very suspicious, the history of previous cases was enough to warrant further examination of the horse. It was subjected to the mallein test, swab preparations were made from the nasal discharge, and

guinea-pigs were inoculated from the swabs. All mallein tests were positive, and all guinea-pig tests negative. As the guinea-pig tests proved negative, no definite action could be taken, with the result that the horse was put to work under well-defined restrictions. Tests were made from time to time with the same results as before. Clinical symptoms have been about the same, and at no time were sufficient to warrant the killing of the horse, in view of the fact that the guinea-pig tests opposed such action. About three weeks ago a swab preparation made from the nasal discharge, which had somewhat increased, was inoculated into a guinea pig, giving a positive result. This has since been repeated three times, two of which proved positive, making three positive out of four tests within three weeks. Upon autopsy, well-marked miliary lesions of glanders were found throughout both lungs.

I mention this case to show the chronic nature of the disease. This form of the disease in horses simulates chronic tuberculosis in man more closely than any other disease of man. The period of inoculation, as in tuberculosis, is indefinite. It is an exceedingly difficult disease to eradicate or even to hold in subjection. This is due to the fact that horses in apparent health may be affected with glanders for months and years, during all of which time it undoubtedly is a source of infection to others. In attempting to eradicate glanders in a large stable, very often the last case discovered may prove to be the cause of all previous cases. An instance of this occurred in one of our large railroad stables in Boston, where glanders kept cropping up from time to time in all parts of the stable. For a long time the cause could not be found. It was apparent that it must be due to some animal which had access to all parts of the stable. An old horse which had outgrown its usefulness, although in seemingly good health, was used for pulling the feed-box about the stable, thereby coming in contact with all the other horses and stalls. It seemed advisable to kill this horse; and, upon autopsy, well-marked miliary lesions of glanders were found throughout both lungs. Undoubtedly, this horse was the cause of the previous cases, although presenting no symptoms in himself.

The usual symptom of chronic glanders is a nodular condition of the mucous membrane of the nose, generally on the nasal septum.

These nodules vary in size from a pin-head to that of a pea. Later these nodules ulcerate, leaving a raw surface, which has a raised irregular edge. Several ulcers may run together, forming a large one. There is very little tendency in these ulcers to heal. They continue to discharge a thick, gluey, muco-purulent discharge, which adheres to the external edges of the nose. There is no odor, excepting when necrosis of the bone occurs. Occasionally they heal, leaving a rough, drawn scar. One or both of the submaxillary glands are usually enlarged, hard and nodular, more or less adherent to the inferior maxilla, and with very little tendency to suppurate. Lymphatic glands all over the body may become enlarged. Nodules followed by ulceration may appear upon any part of the skin, usually the legs. The discharge from ulcers upon the leg is a semi-translucent, thick, amber-colored pus, sometimes occurring as clear serum.

Glanders has long been recognized as an infectious disease; but the cause of its infectiousness was not discovered until 1882, when Loeffler, Schultz, and Israel found the bacillus in glanders tissue. The bacillus mallei is about one and one-half times the size of the tubercle bacillus, varying in size on different medium, having rounded ends, and frequently showing unstained areas. They have no characteristics either of form or staining by which they may be distinguished when prepared direct from a suspected discharge. On potato in about thirty-six hours in incubator, it appears as rather thick, viscid, drop-like colonies, which soon become brownish or amber-colored. Its growth upon potato, together with the peculiar lesions produced when inoculated into male guinea pigs, are the only means of identifying this bacillus. It is found in all lesions of glanders, and sometimes in the blood in small numbers of acute cases.

The method of guinea-pig diagnosis is of considerable interest, because of the fact that cases are seen upon which it is impossible to make a clinical diagnosis. Having a case with one or both submaxillary glands enlarged, nasal discharge, and typical ulceration of the nasal septum, the diagnosis is perfectly clear; and other methods of diagnosis are unnecessary. Cases, however, are frequently met with where the only lesion to be seen is an enlarged submaxillary gland, others where only a slight nasal discharge is present, and still others where the only lesion is an ulcer of the skin. In such cases the clin-

ical diagnosis must be doubtful. Formerly such cases were allowed to remain among other animals until the symptoms had advanced enough to warrant killing. Now we have at hand the inoculation test upon guinea pigs and the mallein test, as aids in early diagnosis. Having a suspected discharge, an emulsion is made in water, and about two cc. are injected into the abdominal cavity of a male guinea pig. If the case is glanders, in from one to three days there appears a swelling of one or both testicles, which later become firmly adhered in the scrotum. When this stage is reached, the pig is generally chloroformed and autopsied. Upon autopsy there is found a nodular deposit of cheesy-like matter upon the visceral layer of the *tunca vaginalis*, which in the guinea pig is continuous with the peritoneum. The nodules extend into the testicles: the testicles are enlarged and become firmly adherent by these nodular deposits to the scrotum. The glanders bacillus may be detected in cover glass preparation made from the direct nodules. Cultures are made upon potato from the cheesy matter of these nodules, and after incubation the glanders colonies are readily distinguished by their characteristic brownish color. It is always well to make cultures upon potato, and not rely wholly upon the guinea-pig lesions, as occasionally enlargement of the testicles, though usually of only one, may be due to some other organism. This has been observed in the work of the Boston Board of Health laboratory in two or three instances; but each of these cases presented on autopsy an abscess of the testicle rather than a nodular condition, and the character of the abscess was readily distinguished by potato culture later.

Special outfits for use in glanders may be obtained at all of the diphtheria stations in Boston. This outfit consists of a cylindrical copper box, containing an 8-inch test-tube, a card for particulars to be filled out by the veterinarian, and a circular of directions. The test-tube contains a large cotton swab, similar to that used in diphtheria work. No medium such as is sent out in diphtheria outfits is used, as the object of the glanders outfit is to convey the suspected material to the laboratory to be used for guinea-pig tests.

This method of diagnosis is now well organized, and has been available to all veterinarians of the city for the past two years.

Upon receiving the outfit at the laboratory, an emulsion is made by

soaking the swab in water. You can readily see that such an emulsion contains usually a mixture of organisms, especially if the swab is from the nose. This mixture may or may not contain the glanders bacillus. If the glanders bacillus is not present, and no other pathogenic organisms in sufficient numbers or of sufficient virulence to produce death are present, the guinea pig, after a few hours or days of depression, recovers completely. If the glanders bacillus be present, and the other organisms also present fail to kill, the typical scrotal lesions or the peritoneal lesions will develop, the former within twenty-four hours to seventy-two hours usually, the latter later on. If, however, acute septic organisms be present in the injected liquid, the guinea pig is likely to die within twenty-four hours, whether the glanders bacillus be present or not, before the glanders lesions have time to develop. In such cases the test is evidently of no value, and should be repeated. Such a result certainly fails to demonstrate the presence of the glanders bacillus, so that a positive report is impossible. It also fails to demonstrate its absence, since experimentally it has been shown that a guinea pig injected with a pure culture of glanders mixed with a pure culture of the pneumococcus (the latter isolated from a case of acute peritonitis in a guinea pig injected for diagnosis) may die within twenty-four hours without glanders lesions. A negative report based on such a case is evidently out of place; and therefore an "unsatisfactory result" is reported, accompanied with a request for another preparation.

During the year 1899, 46 cases have been examined by guinea-pig tests, 23 of which were positive, 14 negative, and 9 unsatisfactory. 5 of these unsatisfactory cases later proved to be glanders clinically.

I have here a table showing comparison between clinical diagnosis and guinea-pig tests: —

TABLE NO. V.—GLANDERS.

SHOWING COMPARISON BETWEEN CLINICAL DIAGNOSIS AND GUINEA-PIG TEST.

Clinical Diagnosis (in Horse).	*Guinea-pig Test.*			
	Pos.	*Neg.*	*Unsat.*	*Total.*
Positive	11	2	5	18
Negative	1	4	2	7
Doubtful	12	8	1	21
Total	24	14	8	46

Hence 57 per cent. of those cases which the attending veterinarian could not decide from clinical evidence at the time were shown to be glanders by the guinea-pig test. These cases, in the absence of the guinea-pig test, would have remained amongst other horses until typical clinical symptoms developed, acting as sources of infection in the interim.

The mallein test is similar to the tuberculin test for tuberculosis in cows, and consists in the injection of a small quantity of mallein, subcutaneously, into a suspected animal, with the result that, if glanders is present, there occurs a high rise of temperature, to 104 degrees F, or more, with a well-marked swelling at the point of injection. If glanders is not present, very little variation of temperature occurs.

Mallein is prepared in about the same manner as tuberculin. Bacillus mallei, grown on agar at body temperature for forty-eight hours in an incubator, is inoculated into a flask of ordinary nutrient broth, to which has been added 5 per cent. glycerine, and the reaction made acid (1.5 per cent). This is allowed to grow in the incubator for about a month. It is then concentrated by boiling to about one-half its bulk, and afterward filtered. One-half of 1 per cent. of carbolic acid is added, and mallein is ready for use in about 1 cc. doses.

The method of testing with mallein is as follows: —

Having by previous examinations ascertained what the normal temperature of the suspected animal is, a subcutaneous injection is made in the thick portion of the neck. The reaction to mallein consists in a high rise of temperature with more or less swelling at the point of injection. The rise in temperature occurs usually in from six to eight hours, requiring the temperature to be taken within about six hours, and repeated thereafter about every three hours. A swelling at the point of injection is always present; but, if glanders is present, it is large, well marked, with abrupt edges. If glanders is not present, the swelling is small and flat. The usual result where a reaction has taken place is as follows: temperature at time of injection, 10 P.M., 101; 5 A.M., 104; 7 A.M., 105; 9 A.M., 105; 11 A.M., 105; 5 P.M., 105; in forty-eight hours, probably back to 102. During the test, no water is to be allowed, but food to be given as usual.

Mallein has been used by this department to a considerable extent, particularly in such cases as were doubtful from a clinical standpoint, and where material for guinea-pig test was not available, as, for instance, where the only lesion to be discovered clinically was an enlarged submaxillary gland with no nasal discharge. Where it has been possible, all horses which have been associated with another animal having glanders, as, for instance, a mate working in the same team with a glandered horse, have been subjected to the mallein test. In such cases, where no symptoms are present and a reaction is made to mallein, such horses have been kept under strict observation by the Board of Health.

Such varied opinions have been expressed by different authorities in regard to the value of mallein as a diagnostic agent, it has been thought well to tabulate the last one hundred cases as showing the actual results obtained in practice.

The following table shows, in a condensed form, the relation of the mallein test to the clinical diagnosis at the time of making the mallein test, and to the final diagnosis based on autopsy, guinea-pig test, or prolonged observations: —

1.		2.	3.		4.	5.		6.	7.	
Clinical Diagnosis.	Totals.	Mallein result positive.	Final clinical diagnosis on positive mallein tests.		Mallein result negative.	Final clinical diagnosis on negative mallein tests.		Mallein result doubtful.	Final clinical diagnosis on doubtful mallein tests.	
			Pos.	Neg.		Pos.	Neg.		Pos.	Neg.
Positive .	38	36	36	—	—	—	—	2	2	—
Negative .	31	4	2	2	25	—	25	2	—	2
Doubtful .	31	25	20	5	2	—	2	4	2	2
	100	65	58	7	27	—	27	8	4	4

Column 1 shows the one hundred cases divided into positive, negative, and doubtful on clinical diagnosis.

Column 2 shows the number positive mallein tests obtained from each of these divisions.

Column 3 shows the final diagnosis of the animal giving positive mallein test.

Columns 4 and 6 give similarly the negative and doubtful mallein results.

Columns 5 and 7 show the final diagnosis on these respectively.

The conclusions drawn from this table are as follows: —

1. All animals, whether suspected of glanders or not, failing to react to the mallein test, may be considered free from glanders. (See columns 4 and 5.)

2. Animals, whether suspected of glanders or not, reacting to the mallein test, may or may not be affected with glanders. (See columns 2 and 3.) It will be seen, however, that 89 per cent. of the animals reacting to the mallein test are affected with glanders.

3. Animals giving a doubtful reaction to the mallein test may or may not be affected with glanders. (See columns 6 and 7.)

Attention is called to the fact that the conclusions are drawn as a result of the above one hundred cases.

The results of the mallein tests have been classed as doubtful in the above table when the temperature before testing was 102 or less, and the temperature during the test failed to reach 104. If the temperature before testing was above 102, the mallein test is also considered doubtful unless a rise of two degrees or more occurs during the test.

I have found the negative mallein reaction of much greater value and more to be relied upon than a positive reaction, contrary to experience in other diagnostic tests where the positive is of more value than the negative. I have never had a negative mallein reaction upon a horse which afterward proved to be glandered, and the total mallein cases now number about two hundred. Positive results are less reliable, as there is little doubt but that horses free from glanders will often react to mallein. While glanders may quite likely be present, you are not warranted in killing upon the positive mallein alone. Doubtful reactions are of no value.

If called up to examine a horse which presents no positive symptoms of glanders and a negative mallein reaction is obtained, one feels quite safe in making a diagnosis of not glanders.

Mallein may now be obtained free at the laboratory of the Boston Board of Health by any veterinarian for use upon animals in Boston.

Glanders in man runs a course very much like acute glanders in animals. The mode of entrance is probably through an abrasion in the skin. An early diagnosis cannot be made; and, in fact, diagnosis can only be made by guinea-pig test from some suspected area, as an ulcer upon some part of the body or incision into œdematous tissue about a joint.

I remember a case which occurred in one of the hospitals in Boston which was suspected of having about all the febrile diseases before a positive diagnosis of glanders could be made. Typhoid, pleurisy, and rheumatism were suspected, until some symptom appeared to offset each of these diagnoses in turn.

In man, glanders is usually a fatal disease, death occurring within three weeks.

Although glanders is a fatal disease in man, the bacillus must usually be of low virulence to man, since very few cases occur in spite of the fact that there is no infectious disease which is handled by a certain class of men with less precaution. It is not uncommon at all to be called to a case of well-marked glanders in an animal, and find a stable groom and the owner dressing the horse, with cuts upon their hands and no disinfection afterward. Veterinarians are often obliged to handle these cases in a very careless manner, as means of disinfection are seldom found in stables. Men who cut up glandered horses at rendering places are seldom without a cut or two upon the hands, still glanders rarely results.

THE PRESIDENT.— The next paper on the programme is entitled "The Necessity for more Thorough Inspection of Sanitary Conditions in Massachusetts," by Dr. W. S. Everett, of Hyde Park.

THE NECESSITY FOR MORE THOROUGH INSPECTION OF SANITARY CONDITIONS IN MASSACHUSETTS.

BY DR. W. S. EVERETT.

It may seem like presumption for one who has sat for years,— a willing and to some extent, at least, an appreciative listener to the many valuable and suggestive papers that have been presented here, who cheerfully acknowledges his indebtedness to those papers and the equally valuable discussions by which they have been followed for much of profitable instruction,— it may, let me repeat, seem like presumption for such a one to come in before this Association, and attempt to persuade its members into the belief that the work which they are especially appointed to accomplish is not thoroughly performed.

But whoever reads newspapers, whoever keeps abreast with the medical history of the times, whoever has made himself familiar with existing conditions within the limits of the State, whether as members of boards of health or not, is perfectly well aware that there are yet many places within our borders where the simplest laws of health seem to be either ignorantly disregarded or set at defiance by some motive that is more to be deplored than ignorance and that cannot be so easily excused.

And it casts no reflections upon either the efficiency or the public spirit of existing boards of health to admit that this is true. There are causes that are amply sufficient to make it impossible for them to accomplish more in this direction than is now done. But, that there is urgent need that more should be done, probably no one who is well informed entertains a doubt.

But in what way a better service can be obtained or rendered is a problem that is disturbing the peace of many thoughtful minds.

Some time in August last an article appeared in some of the daily papers, stating that the honored President of this Association — in view of the sudden outbreaks of disease that sometimes appear in different localities within the limits of the State — had recommended

that a committee — to consist of some thirty members or thereabouts, perhaps — should be appointed, whose duty it should be to make a more rigid examination of the primary causes of these sudden outbreaks and epidemics, and the best method of dealing with them, and also of dealing with unsanitary conditions generally, than is possible in conditions that at present exist.

It was stated distinctly that the purpose of this committee should not be to supersede or interfere in any manner with the work or the duties of the local boards of health, but rather to co-operate, while pursuing an entirely separate and independent method of investigation, with existing boards, and to search out for themselves the places where disease-laden germs might be expected to propagate and multiply, and simply to report the result of their investigations, with such suggestions as might be deemed fitting, to the local boards whenever cause for such reports should be found, and also to make their report to the State Board, as occasion should require.

This recommendation is far-reaching, and it would seem that it must go a long way toward reaching and surmounting many of the difficulties and obstacles that beset the way.

A few days after this article appeared, a request was received by the writer of this paper from the *Advertiser*, asking that he would write out for publication in its columns a statement of his views concerning the expediency or necessity for the appointment of such a committee as had been recommended.

Previous to that time the special need for such a committee had not been considered. But, when attention was called to it, first impressions were favorable to such an appointment; and subsequent and maturer reflection has only strengthened the conviction, and fortified the opinion, not only that there is need for such a committee and that there is ample and useful and profitable work for it to do, but that such a measure is deserving of all commendation, encouragement, and support. But individual opinions amount to but little. It is the general consensus of public sentiment that must be relied upon to sustain it; and, if it is deemed to be worth a trial, that must be invoked to yield to it a cordial support.

And so, before this measure gets any farther, while yet in its embryonic state, the probabilities and the possibilities resulting from its operation should be thoroughly and fully considered and made plain.

Whatever advantages its advocates are prepared to claim from its operation should be brought fully and fairly into public view. And, if there are objections to be urged against it, they should be made clearly to appear.

It is a measure of no small moment to the people of this commonwealth. For one of two things will result from its adoption. Either a great and lasting improvement in its hygienic condition will be secured to the State, thereby insuring a permanent benefit with which no pecuniary consideration can be compared, or otherwise the State will be burdened with an additional and considerable expenditure to support a useless, unnecessary, and impolitic, if not dangerous scheme.

It seems appropriate that a sanitary measure of so much importance should be brought squarely before this Association. Dedicated, as it is, to "the advancement of sanitary science in the Commonwealth of Massachusetts," it should be fully considered here; and, if it is decided to be a step in advance in the great problem of public health, it should not only receive its initiatory impulse, but its progress onward from a theoretical project till it shall be expanded into a fully developed law of the land should be directed by a no less influential and intelligent and authoritative body than the Massachusetts Association of Boards of Health.

The place where such a commission as is contemplated in this recommendation would have its greatest and best opportunity to be of benefit to the community would be in determining and locating the ultimate sources of danger at the places of their origin, before those dangers had developed into actual fact, and before it is usual for them to attract the attention of any one else. And, manifestly, something is wanting here to make our present system of hygienic sanitation complete. There is work here that should be done by somebody that has never yet been attempted in the right way, and in conditions at present existing is likely to remain undone to the end.

Some different management must originate somewhere, some more effectual method must be devised of dealing with this subject, if the elements of danger are ever to be eliminated from our midst.

Epidemics of typhoid fever appear in various localities; and there

is every reason for entertaining the gravest suspicion that the causes from which they have taken their origin were preventable, and might have been removed if proper action had been taken at the right time.

Visitations of diphtheria come upon us like an avalanche, and surprise us by being directly traceable to the products of a single dairy herd. And, worst of all, cupidity and greed are found to be more potent than all other considerations; and milk is sent to market to be used in families, all unsuspecting of danger, that is drawn from the udders of cattle that have not been relieved of their burden for forty-eight hours — and more.

So much we know. And these things are happening, not alone among the indifferent and unconcerned residents of neglected places, but are only of too common occurrence, even in communities where the search-lights of science are blazing forth their brightest rays. And, while these things are possible, the work of the sanitarian among us cannot be regarded as an altogether unqualified success.

And if, as there is too much reason to fear from reports that come to us, there are those contributing to the public milk supply who — either through ignorance, carelessness, thoughtlessness, laziness, indifference, or for some other reason — are keeping their cattle in dark and damp, foul-smelling, ill-ventilated, overcrowded quarters, who have regard neither to cleanliness nor wholesomeness in the methods of their milk production, and who are keeping their stock with reference to the drain upon the bank account rather than the quality of the product that they are sending to the markets, they must be made in some way to feel the moral accountability that is resting upon them when an epidemic breaks out among their patrons, or, if this is found to be impossible, must be made to realize their legal responsibility to the laws of the land. Whatever else may happen, those who are so unmindful of the plainest requirements of sanitary principles must not be permitted to mingle their products with that which is produced in the most careful and painstaking manner, and by thus contaminating and polluting the whole output bring disgrace and liability to prosecution upon all alike.

And, if there are people whose water supply is polluted by surface drainage or by percolation from some near-by privy-vault, or whose

sink drain forms a direct conductor to their dwellings from some adjacent miasmatic or poisonous slough, they must be made to comprehend the fact that they are living in the midst of dangers compared with which proximity to some dynamite depositary is less to be feared.

If there are stagnant pools and waste places in outlying regions that are polluting the air with miasm and contagion, they must be sought out and reclaimed to uses that, at least, shall not be a menace to health.

Science can do much — has done much already, and is constantly doing more and more — to teach us to recognize these dangers and to indicate the direction from whence protection must come.

It has done much to make it hazardous for the enterprising but unscrupulous dairyman either to attempt to increase the quantity or tamper with the quality of his dairy product, and so augment his revenue by artificial means.

It has taught us that water may be unfit for domestic uses, and yet give no sign to taste or sight or smell.

It has taught us that the bacillus of disease may linger in waste places, and yet give no warning to any material sense. It has taught us that the most villanous odors are not always the most dangerous; and it has also taught us that the festive microbe may be not only quietly marshalling his aggressive forces to assail his unsuspecting victim in undisturbed tranquillity in swamps and marshes or in the earth's most pleasant places, but may also be joyously luxuriating in riotous excesses in those beautiful spots where the landscape gardener has exhausted the resources of his art, where the air is laden with delicious fragrance,— where the rose and the violet, the lily and the sweet-brier, abound.

It has done all this. But there are elements of danger which science cannot reach. It cannot distinguish and separate the integral particles of pure milk from those that are not fit for use, when once they have been mingled together; and the service of just such a commission as is here contemplated is imperatively demanded to make us sure that the pure and the impure products shall never come in contact with each other.

It cannot determine whether cattle are properly housed and fed

and cared for, whether barns are cleanly, or whether cans and jars are so thoroughly cared for that they are safe and proper receptables for a milk supply. The service of just such a body as is here contemplated is constantly needed, whose careful inspection and unremitting watchfulness shall be a sure protection against the violation of sanitary requirements, in these particulars, in all places, and at all times, even though, to secure so great an object, persistent house to house inspection and observation should be required.

It cannot extend the shield of its protection over the State's broad surface, and point out the regions where oft-times unsuspected dangers lie; and nothing but the investigations of just such a company of searchers as this recommendation contemplates can protect the State from a constant menace from dangers of this insidious character that are latent in these neglected spots.

It will not answer to tell us that these matters can be safely intrusted to the supervision of the already existing boards of health; for, as has been already stated, there are courses, that are not likely to cease to be operative, that will always continue to interfere with and to interrupt their work.

Our competence or our abilities may not be called in question, but the conditions in which we labor are neither conducive nor favorable to results that are so much to be desired. We have had all the opportunity that is likely ever to be given us, and we have been wrestling with the problem for years, to the best of our ability; but these dangers continue, and the work is not effectually performed.

Whenever epidemics break out, we are ready to investigate and prompt to take such action as the nature of the case requires. But the mischief is done then. The remedy has come too late. Perfection does not abide upon this planet; and perhaps no system can be devised that shall be absolutely perfect in its operation or that shall detect danger in every instance with unerring precision before its poison shall be diffused around.

But some of the difficulties with our imperfect methods may be clearly seen. In the first place, one great difficulty seems to be that boards of health generally, throughout the State, except perhaps in some of the larger cities, are very inadequately compensated, if at all, for the performance of such duties as even now are required at their

hands. Most of them depend upon other resources for their livelihood; and, if they are obliged to depend upon any other vocation or calling for their living, their time must, in the nature of things, be devoted to that vocation, and it becomes simply impossible for them to give the time that is needed to the interests of the State or to take the time from their daily labors that is necessary to make this department of State service as thorough as safety requires.

The usual course probably in most instances is to wait for complaints to be presented before they are investigated. Boards do not feel it to be incumbent upon them, as a general practice, to go out on tours of investigation to see what can be found. With the small appropriations made for their salaries, it is impossible for them to give the time to it that such a practice would require. Yet nothing else can accomplish the purpose for which boards of health are chosen. They are not to be charged with inefficiency or with intentional neglect of duty. But the work is more than they can do, as things are at present conducted.

When complaints are brought in to them, they act promptly, efficiently, and well. The results are seen in the diminished death-rates of former years. But it should be easier to prevent the occurrence of these epidemics than to restrict them in their course.

Another difficulty that interferes with the action of boards of health is that in the nature of things they cannot be quite independent in their acts. Whichever way a question is decided or whatever action determined on, when a complaint comes in, one party or the other is pretty sure to feel aggrieved at the way it has been settled, and so becomes an enemy,— probably for life. It is not pleasant to make enemies.

No one desires to make them needlessly; and the temptation to pass over some things lightly that would possibly be more severely dealt with if the effect of such action upon one's annual income, or his standing in the good opinion of his friend, or the alienation of his friendship, were not constantly in mind, cannot be entirely forgotten; and it must be admitted, perhaps with humiliation, that it cannot be easily overcome. Perfect independence, and therefore and consequently perfect service, cannot be secured in this way.

For these and similar reasons which are apparent, but which the

time of the Association must not now be taken to enlarge upon more fully, it seems reasonable to believe that a commission such as has been suggested by our President, that shall be paid a compensatory salary, and that shall be required to devote their whole time to the service of the State, and whose sole business it shall be, not to undertake or interfere with the work of our present boards of health, but to seek out by independent means and recommend for action such cases as might otherwise be long delayed before they would come to light, but which are a constant menace and danger to the health and lives of the whole community where they abound, would be a greater security and protection to the people of the whole Commonwealth than anything in this direction or contemplating this achievement that has ever been devised.

The advantages to be derived from such a commission would be many and great. Its independence, at least, would be assured. Its salary would not depend, as in too many instances now, upon its keeping the peace with quarrelsome or pugnacious neighborhoods; and the time would be at its disposal to give its attention wherever and whenever it should be required.

The chief objection to it, it would seem, must be the expense attending its support. It is not easy to see what else can be urged against it, and whatever there may be is left for its opponents to discover. It obstructs no machinery in the operation of local laws. It usurps no power. It disarranges no plan, it compromises no one's honor or dignity; but it should be of the greatest assistance wherever danger is lurking and wherever the germs of disease may be found. And there is every reason for believing that the people of the State will cheerfully and promptly respond when called upon to sustain this measure by unhesitatingly appropriating the necessary funds to carry this project into execution.

And now, if it is the proper thing to do at this stage of our meeting, this paper will be brought to its conclusion by recommending that a committee to consist of such a number as may be thought desirable, of which the President of this Association shall be chairman, be appointed with full power, and with instructions to present this matter to the coming legislature in whatever manner shall seem to them best and most likely to secure its immediate enactment into a law of the State.

PROFESSOR W. T. SEDGWICK.— I cannot help rising to express my admiration of the point of view of the last speaker. I think that we in Massachusetts are now sufficiently one people to be ready for a somewhat more centralized sanitary bureau of information. The time does not allow any extended remarks on this subject; but I have thought for a long time, especially during the last summer when on a visit to European countries I gave considerable study to European methods of sanitation, that the point of view taken by the last speaker is sound. I should like to second his motion that such a committee be appointed. I do not remember whether he stated the number of persons. I should say a committee of five, to be appointed by the Chairman.

The motion was put to vote, and carried unanimously.

THE PRESIDENT.— The matter is of so much importance that, with the permission of the Association, I will announce the committee later. We have had to hurry through, in a somewhat unseemly way, possibly, the list of papers; but there are certain things which some of us are willing to stay here until midnight to discuss. I certainly am. We will now go back in the list of papers for such discussion as the members of the Association now present are prepared to make on these various topics. I would like to ask if there is anything to be said with regard to the paper presented by Dr. Mason. It was a very intelligible and very interesting account of a very successful process used in one city in the Commonwealth. When it appears in the bulletin of this Association, it will be read with a great deal of interest and instruction. If there is nothing to be said on that subject, I am sure there is something to be said upon the matter of glanders. I understand that Fitchburg has had an unfortunate experience in that matter, and I think Dr. Thompson can say something of interest to us. [Applause.]

DR. THOMPSON.— Mr. Chairman and gentlemen of the Association, I thank you for the honor conferred upon me in asking me to say a few words in regard to the subject of glanders as it occurs in the human subject. Owing to the lack of time, I will speak briefly.

It has been my fortune — or misfortune — to have had the care of two cases of glanders occurring in the human subject. The disease occurred in the case of a father and son, aged fifty-three and sixteen years, respectively. The source of infection was a horse that died of glanders on the 6th of July of the present year. The horse was at the State Encampment,— the first or second brigade, I have forgotten which,— and came home sick on the 30th of June. This father and son took care of the horse the following week, and the horse died the 6th of July. The 8th of July I was called to see the son. He was evidently suffering from some serious disease. At the same time I was asked to see the father. The son complained of pain in his right side and of fever, and had a furred tongue. I did not know at this time that the horse they took care of had died of glanders. I knew the horse had been sick and had died, but was told that the horse died of some lung trouble, and that there was nothing serious the matter with him. My first thought with regard to the son was that he was suffering from pleurisy, and accordingly I prescribed for him. The son was in bed; but the father was about the house, and said perhaps I had better look him over, as he was not feeling very well. He complained simply of general malaise and of headache and pain in the back. He said he had been to Fall River the previous week, and that perhaps his business cares there had made him tired, and that there was nothing special the matter with him except that. I prescribed something for him, and he went out the next day and the following day. I saw the son on those two days; but, the father being away, of course I did not see him. The next day I found the father in bed, and he was evidently suffering from some serious disease. He had a temperature of 102 degrees; and, on looking him over, I found that his spleen was enlarged, and I thought I discovered a few papillæ and small hemorrhagic spots beneath the skin. I thought in his case that he might probably be suffering from typhoid fever; and in a day or two I had the vidal test taken, but that proved negative. In the mean time it came to my knowledge, indirectly, that the horse that died had died of glanders. Then I naturally thought that there might be some connection between the two; and, to make a long story short, that proved to be the case. The most striking features about the father's case at this time were the

condition of his nervous system, a typhoid condition, and his temperature, which was over 102 degrees, and was increasing steadily.

In view of these general symptoms, having, as I have said, made up my mind that there was no typhoid fever, from the symptoms which further developed I soon decided that it was a case of glanders. Abscesses developed in the muscular tissue, the so-called nodes or farcy buds, and septic symptoms developed more and more. Pustules began to appear in various parts of the body, and developed very rapidly. Another thing that appeared was arthritis about the left knee joint. He went on from bad to worse, and died the fourteenth day. I left the care of the son at the third day with the symptoms of pleurisy, as I thought. He soon began to develop trouble about his right elbow joint; and, to make a long story short, he developed symptoms similar to the father's, and finally had pustules. The only difference between the case of the father and that of the son was that the son seemed to have more resisting power to the infection. The poison developed more slowly in his case. He was taken sick the 8th of July, and lived until the 31st. Toward the last of his disease he became delirious, his temperature increased to 105 degrees, and he finally died, as such cases very surely terminate. We were fortunate enough to obtain a *post mortem* in the case of the father, who died first; and Dr. McGrath, of the Harvard Medical School, came up and made the autopsy. I have not yet received the full pathological and bacteriological reports; but they will be made, and will be published at some future time. In the case of the father the *post mortem* disclosed nodes and abscesses about the lungs, nodes and abscesses in the muscular and cellular tissue; and he also had a septic joint — so-called septic arthritis of the left-knee joint — and also periostitis of some bones. One thing that was remarkable in his case was with regard to his respiration. He had no discharge from his nostrils at all. He had a rapid respiration, and seemed to have an unusual dryness about his nasal fossæ and about his throat and nose. At the autopsy there were lesions found at the upper part of the fossæ of an ulcerated and hemorrhagic nature, and nodes and abscesses in the lungs and an enlarged spleen. The other organs were comparatively healthy.

One interesting point which I recall was that the culture taken

from the blood of the heart, and also those from the abscesses on the lungs and from the abscesses in the extremities, showed *bacilli mallei*. I think one of the most striking features of these cases was the serious nature of the disease from the first. It was evident that some serious sepsis was going on in both. The temperature rapidly rose, and kept at a high point until death. Another striking thing was the utter inefficacy of any treatment. The treatment that I instituted was in the main supporting and stimulating. At the suggestion of others who saw the case, we tried for two days the mallein treatment,— the injection of mallein. There was no reaction from injection of the usual dose, and I tried it but two days. There seemed to be no good reason, either, for continuing it, so far as I could judge from what I learned of other cases.

These certainly were interesting cases, and I am sorry the time does not allow me to go into more extended description of them. I am sorry I have not been able to give you a more accurate and careful description. As I said before, at some future time I shall report the cases; and the pathological and bacteriological data that are with them will also be very full, from the autopsy which was very carefully made by Dr. McGrath, and I am sure they will be very interesting to all. Any who would like copies of the reports can be furnished with them after they are published. [Applause.]

THE PRESIDENT.— Is there anything more to be said upon these cases?

DR. GAGE.— I would like to ask some bacteriologist present if there is any early method of diagnosis in a case of this kind, before the more marked characters develop, by an examination of the blood or otherwise.

DR. THOMPSON.— It seems to me, from what I know of these cases, that there may be a chance from examination of the blood and possibly from examination of the urine. It is said the *bacillus mallei* is present in the urine and in all exudates. It is a fact that the bacillus was discovered in the blood in one of these cases. Another thing, it seems to me, from the symptoms observed in these cases, that the infection is carried and must be carried through the blood rather than in any other way on account of the rapidity with which

the symptoms develop, and the universality, so to speak, of the symptoms. These pustules will develop in twenty-four hours. You will have a very small papule somewhere on the skin, and at the end of twenty-four hours it will develop into a full pustule. Some of these pustules have considerable injection around the base, and many of them remind you of the vesicles and pustules in small-pox.

DR. MASON.— I examined a specimen of the blood from the father to test it for typhoid fever, as stated by Dr. Thompson, which proved negative. At that time, however, the doctor knew nothing about the glanders infection, so there was no examination made in that line. But I do not think, in reply to Dr. Gage's question, that there is any way that you can tell — none that I know of, at least,— by the blood. My idea is that there are bacilli in the blood, but they are very infrequent early in the disease. If a bacillus stops or lodges in a certain place, it very quickly becomes a focus. The bacilli propagate so rapidly that one or two lodging in one place will produce a node or postule probably within the time that Dr. Thompson states,— twenty-four hours. But I think they are so infrequent that it would be a very difficult task, indeed, if not impossible, to isolate them from the blood in the early stage of the disease.

THE PRESIDENT.— In his welcoming remarks here, his Honor, the Acting Mayor, called our attention to some local conditions in Fitchburg that interest Fitchburg very much and that are of a sort that interest every town and every city in the Commonwealth. I should be very glad, and I think the Association as a whole would be very glad, to hear something more about it. I am told that Professor Sedgwick knows more about it than almost any other man. He generally does, about these matters; and I think we should all be glad to hear from Professor Sedgwick. [Applause.]

PROFESSOR SEDGWICK.— The President gives me a very damaging reputation.

THE PRESIDENT.— Not at all.

PROFESSOR SEDGWICK.— It is usually the case that the man who knows it all knows nothing. But in this particular case I want to say a word as spokesman for the Sewage Commission, and the

Board of Health, and the citizens generally of Fitchburg. Fifty years ago the river which you have seen flowing through Fitchburg was a clear, bright, agreeable-looking stream; but fifty years ago Fitchburg hardly existed. In 1885 Fitchburg contained about 15,000 people, and had got to the point of polluting its river very seriously, indeed. By the last census there are 30,000 people in the city. The population has doubled in the last fifteen years, and from the little town of fifty years ago Fitchburg has become one of the proud cities of the Commonwealth. The citizens of Fitchburg have long looked upon their river with mingled feelings,— respect, because it is the source of the town's growth and wealth; affection, for what it was; and a certain amount of fear, for what it was becoming. They have, at various times, talked of doing something about it, and have always intended to make it right; but these things, as you know, even in Massachusetts cities, go slowly. The unsanitary conditions that Dr. Everett dwelt upon come upon us not suddenly. If they did, we should resist them; but they come little by little and almost unawares. The river gets a little worse every year, but not so much worse as to very much embarrass or frighten the people at large.

Fitchburg, however, prides herself on her situation, her fine air, her prosperity, and her energy. And the time has come when the citizens of Fitchburg are determined to clean up the river. They are determined to come into line with the most alert and active cities of the State, and to cease polluting the north branch of the Nashua, so that that branch may become as clear and, we hope, as famous as the south branch, which goes to make the great Wachusett reservoir. In 1895 the citizens of Fitchburg, through their city government, went so far as to take steps looking toward the purification of the river locally. They appropriated money, and had plans made by their able engineer, Mr. Hartwell, and the consulting engineer, Mr. Allen of Worcester, whom they employed for the building of a trunk sewer which should take out of the river in their immediate neighborhood all the sewage and wastes of the city. They did not, however, consider what they should do with the sewage after they had got it into the trunk sewer. It is fair to suppose that they thought that, if they could take it down toward Leominster and put it into the river

at that point, Fitchburg, at any rate, would be all right. [Laughter.] And so, no doubt, it would have been. But, perhaps with the feeling that that, after all, was only a part of the problem, nothing was ever done about it. And it is only within the last few months that a determined stand has been taken to purify the river within the limits of Fitchburg and then to take the waste matters, and not put them back into the river, but somehow purify them, so that the whole river in this neighborhood shall be clean and sweet. Last April a Commission was appointed, which is known as the Sewage Commission, consisting of the mayor, chairman *ex officio*, the city engineer, *ex officio*, who is still, fortunately, Mr. Hartwell, and three other eminent citizens,— Mr. Woodward, Mr. Estabrook, and Mr. Lawton. These men have the confidence of the community. They have no axes to grind,— they have only the river to clean; and they have the good reputation of Fitchburg at heart. You will notice, as you see the river, that it is very filthy and dirty. It is a menace to the well-being of the city and destructive to the well-being of the river below. I hope that before the next meeting of this Association in Fitchburg — and may that not be a very long time — the city will have taken steps toward the proper purification of its sewage. This, however, is a matter for careful investigation and inquiry. And the Sewage Commission intends, and is authorized by the city government, to employ expert aid and counsel, such as a distinguished sanitary engineer, to prepare proper plans for the right purification of the river. Fortunately, there is in Leominster, just over the line from Fitchburg, a lot of comparatively waste land, which on the face of it seems to be very well adapted to sewage purification. And, if this city of 30,000 inhabitants shall first build an intercepting or trunk sewer which shall carry the wastes away from the river within the city itself and then purify them on this waste land and return the water to the river below pure and sweet, and shall do it in a scientific and economical manner, another leaf will have been added to that crown of laurel which Massachusetts already wears for her scientific method of dealing with these problems.

Massachusetts is a State of cities, and is already looked up to all over the world for some of the best experiments that have ever been made in sewage purification. Fitchburg has the opportunity to

profit by the experience that has gone before. It is her intention and her strong resolution, so far as I know it, to carry out the best plan for her sewerage in the right way. I think that this Association ought to know that one of the principal cities of the Commonwealth is determined to cease polluting the river within its borders, and to install here a system of sewage purification thoroughly up-to-date, of the latest and best type, economically but thoroughly built, and in every way creditable both to the city and the Commonwealth. The Board of Health has been helpful in every way. The citizens are willing and ready, I think, to do the right thing. It seems to me a matter of general interest to this Association, and especially of local and timely interest on this occasion, to know that this beautiful and progressive city whose guests we are to-day is about to embark upon a sanitary scheme of so much local importance and general significance. [Applause.]

THE PRESIDENT.— I hope the Association may hear something more about this. It certainly is a most interesting matter. I do not wish to depreciate in any way the south branch of the Nashua; but I would only like to say, as a mere matter of justice, that, if the Metropolitan Water Board had taken the south branch of the Nashua below the thriving town of Clinton, we should not have been quite so proud of it. I hope we shall hear something more about this Fitchburg experience.

MR. WOODWARD.— I think the professor, in his statement of the case, has covered the ground thoroughly and ably; and I know that no one could have stated it better. All I can say is that those of us who live in Fitchburg and are interested in this project are going to do the very best we can. If we can learn what the proper course is, we shall certainly pursue it; and we think we have some very able men to whom to appeal. The Massachusetts Board of Health will give us, I presume, all the information it can; and we shall ask of the cities of Massachusetts all the advice which they can give. We have already been to Worcester, and received very valuable suggestions from that city. The gentleman from Worcester at my right says he hopes we won't be at the expense in experimenting, and will

avoid some of the mistakes his city has made. I hope we may. It seems to me in the year 1900 we ought to be able to start from the very first and work directly toward some desirable end, so that we shall know about what we are going to do when we get our works in operation. The question, I know, is new, and is in the experimental stage; yet I believe enough has been accomplished, so that we can go forward without great mistakes. [Applause.]

MR. COFFEY.— I just want to say a word. I said to the gentleman who has just spoken that, *if* any mistakes had been made at Worcester, I hoped they would be able to avoid them. [Laughter.] I did not admit that any mistakes had been made. [Renewed laughter.] However, Worcester has spent a great many dollars on her sewage purification scheme; and, certainly, the money that has been spent there in perfecting that scheme of sewage purification is for the benefit of other cities in the State. We have always contended in Worcester that the State ought to reimburse us for the sum of money that we expended there, because we have been educating the rest of the State. [Laughter.] Our system of sewage purification has cost us into the millions, and I certainly hope that Fitchburg will not find it so expensive as Worcester has. We are now engaged in doubling our sewer system; that is, formerly the combined system was in force. The storm water and the sewage proper went altogether into the Blackstone River,— a river in name only. It was, after all, only a small stream; and I imagine your river here in Fitchburg is a good deal like it in that respect. Now we have been forced by the necessities of the case, and by the Massachusetts legislature [laughter], to build a new system of sewers, taking the storm water out of the sewage proper; and that has cost us not only a good deal of money, but a good deal of inconvenience. The streets are torn up all over the city by the building of this new system of sewers. The houses will all have to be detached. Where formerly the rain-water leaders all emptied into the regular sewer system, they have now all got to be detached, and run into this sewer which will take only the surface water. The system of purification is a chemical system,— chemical precipitation; and lately we have supplemented that by adding

a filtration scheme, because the towns below us have complained that the sewage was not sufficiently purified or the effluent that went into the stream was not sufficiently purified, and that, consequently, the nuisance still existed. The legislature, and, I think, the Supreme Court, has insisted that Worcester should go to still greater expense, in order to more fully purify its sewage. There is no question but what it was a nuisance below Worcester. There is no doubt about that. No man in Worcester will deny that. The only thing that we in Worcester claim is that we were allowed by the legislature originally to use that stream as a sewer. After we had so used it, and Worcester had grown to be one of the great cities of the country,— as you know by the last census, we are growing very rapidly there, having now 118,000 population,— its sewage was turned into this small stream, and made it very foul and very much polluted. But I only got up to say a word in explanation, because the gentleman on my left did not clearly understand what I said. I am not willing to admit that Worcester has made any mistakes. [Laughter and applause.]

Professor Sedgwick.— I want to say a word about Dr. Everett's paper. I believe that the time has come for Massachusetts to take another forward step. In this family of Massachusetts people we may venture to say what perhaps we would not say publicly outside; namely, that Massachusetts has led in sanitary matters in this country for a number of years, perhaps always. That is, it has led the other States, it has led the rest of the United States, and in some respects it has led the world. But in certain other respects, although still perhaps ahead of other States of this Union, it is lamentably behind the times. The matter which Dr. Everett has touched upon I regard as a vital one. It was said in England and on the Continent,— particularly in England, which has always led the world in sanitary matters,— some years ago that they never would get ahead any until they had two things: first, a somewhat more centralized sanitary administration; and, second, medical men more highly educated on the sanitary side. Those ideas were carried out. The sanitary administration was made more centralized and the universities began to train men, and give them the

degree of Doctor of Public Health. I believe that eventually we shall have both of those things; and I want to see Massachusetts lead,— not necessarily exactly along these lines; for precisely as our cities and our universities and our technical schools differ from those of Europe, and always must differ from them, so our sanitary systems and our systems of medical education are bound to differ from those of Europe. But the ends to be reached are very much the same in both cases. We want, for one thing, to relieve the local boards of some of the pressure of local influence. Secondly, we want to make permanency of tenure in sanitary matters much more secure than it is to-day. Why is it that the faces of the members of this Association change as they do? It is not death that does it. It is the system of rotation. A man just gets well experienced in the board-of-health work, when out he goes; and another man, who knows little or nothing about it, comes in. That has its advantages. It educates a lot of the members of a community in sanitary matters up to a certain point; but when, as was the case this summer, I find a man in an English town who has been the medical officer of health in all that district for twenty-five or thirty years, who knows all the ins and outs of all that region, who can put his finger right on the map and show you just where the bad places are, and where they are doing good work, who is secure in his position and has his profession in doing that work as a medical man, why, you can see — any one can see — that there is a better administration going to come from it. We want less local pressure on boards of health. We want greater permanency of tenure among the officers of boards of health, and then we want medical men more highly trained along these lines. Of course, the universities, as a rule, are not going to prepare men until there is something for them to do. You cannot expect men to go and fit themselves to be medical officers of health, and know all the ins and outs of sanitary science as well as of medicine, and then have nothing to do.

Now it is a great problem, of course; and I know that local influences are at work,— this, that and the other. No matter. Massachusetts is a State of cities. It is a State of marked intelligence, and it has got to lead the country in these things as well as in other things; and somehow or other — either in these ways or in similar

ways, or in some other ways — we have got to have those things that I have mentioned before we shall have sanitary administration arranged as it ought to be in a great modern State. And the art is so long nowadays that it is not possible for a busy practitioner to turn in and make the ideal board-of-health man,— I mean in respect to administration, the man who shall suddenly become the executive officer of a board of health. That position needs special training, and is going to need it more and more all the time. I want to see this State lead, and I want to see this Association lead. I believe this Association has breadth enough and intelligence enough to go before the legislature, and say, "We want some small changes looking in this direction, something which before long shall lead us up into a more perfect administration." We have got great things still to contend with. Our typhoid fever deaths are far larger than they ought to be, even in our State,— far larger than in most well-regulated States. Our general death-rates are a good deal higher than they ought to be. In Oxford, where I spent some time this summer studying sanitary administration, the death-rate fifteen or twenty years ago was as high as it is to-day in Boston. To-day the general death-rate is only $14\frac{1}{2}$, and it has been going steadily down since they got better administration. They had no typhoid deaths at all in that city of some 50,000 people all last year. It is wonderful the way in which they stamp out anything of that kind that comes in, after following it up sharply. They are not satisfied with general investigation. They are not busy physicians who have to steal time to do these things; but their health officials are men appointed to do those things and do nothing else, or very little else. The result is there is specialization there, there is good service. We have got to come to something of that kind, or our typhoid deaths will continue to be a reproach to us, as they have been for many years and are to-day; and so with many other diseases.

I think Dr. Everett has done a commendable thing for the Association in bringing this matter up. There are places in this State that need to be more carefully looked into. We don't want to rest on our oars: we need to go ahead. I want to see this Association, and especially this State, go ahead and lead the country, as it has long led it, in sanitary matters. [Applause.]

MR. COFFEY.— I want to move that the Association extend a vote of thanks to the Fitchburg Board of Health, and through them to the city government of Fitchburg for their generous hospitality shown to the Association to-day.

THE PRESIDENT.— You have heard Mr. Coffey's motion, which every man outside of Fitchburg seconds; and I will put it to a rising vote.

The motion was put, and the assembly rose to its feet. The meeting then adjourned.

OLIPHOL

POWERFUL,
CONVENIENT,
ABSOLUTE.

A General Disinfectant, Antiseptic, and Deodorant.

NON-POISONOUS, STAINLESS, AGREEABLE.

Removes instantly all offensive odors of every kind and description. Will not fade, stain, or destroy any fabric. Put up in pints, quarts, and in carboys. Prices upon application.

NATIONAL INSECTICIDE COMPANY,

11 Central Street, Boston, Mass.

Glycerinated Vaccine Virus.

Pure and Reliable Animal Vaccine Lymph, Fresh Daily.

SEND FOR ILLUSTRATED PAMPHLET.

10 Ivory Points, double charged, $1.00.

10 Capillary Tubes Glycerinated Vaccine, $1.00.

Orders by Mail or Telegraph Promptly Dispatched.

NEW ENGLAND VACCINE CO., Chelsea Station, Boston, Mass.

Wm. C. Cutler, M.D. **Chas. N. Cutler, M.D.**

294 BROADWAY.

BILLINGS, CLAPP COMPANY,

404 ATLANTIC AVENUE, BOSTON.

We manufacture and deal in all the leading **Disinfectants** and **Preservatives.**

FORMALDEHYDE, CARBOLIC ACID,

Peroxide of Hydrogen, Borax, Boracic Acid, etc.

Surgeons' Sterilized Supplies.

Sterile Suture Materials.
Sterile Gauze Dressings.
Moist Medicated Gauzes, in glass containers.
Plaster Paris Bandages, in air-tight cans.
Flannel Bandages.
Gauze Bandages.
Cotton Bandages.

Splints and Splint Materials.
Patients' Outfit for confinement, consisting of large pad for the bed, Sterile Napkins, Binder, Pins, etc.
Special orders for confinement cases prepared and sterilized.
A complete outfit furnished for surgical operations in private residences.

All Goods delivered Free in City Limits.

Successors to
PEAKE & BUZZELL.

L. H. BUZZELL & VAIL,

126 CANAL ST., BOSTON, MASS.

Telephone, No. 1841-3 Haymarket.

Sanitary
Milk Products.

H

TRADE MARK.

H. P. HOOD & SONS,

MILK CONTRACTORS.

For more than half a century we have supplied the Boston trade with pure milk and its products. Our success and increased business speak for the quality.

BACTERIOLOGICAL CONTROL OF DAIRIES.

CREAMERY, - - DERRY, N.H.

BOSTON DEPOT,
394 Rutherford Avenue, CHARLESTOWN.

TELEPHONE CONNECTIONS.

CITY OF BOSTON

Registry Department.

ROOM 5, OLD COURT HOUSE.

TO PHYSICIANS AND MIDWIVES.

Physicians and Midwives can obtain blanks for returns of Births on application at this office, or they will be mailed on request.

Extract from Chapter 444 of the Acts of 1897.

An Act Relative to the Registry and Return of Births, Marriages, and Deaths.

SECTION 3. "Physicians and midwives shall on or before the fifth day of each month report to the Clerk of each city or town a correct list of all children born therein during the month next preceding, at whose birth they were present. The fee of the physician or midwife shall be twenty-five cents for each birth so reported."

All births in Boston to be reported to this office.

E. W. McGLENEN,
February 1, 1901. City Registrar.

Insist upon having your drinking-water delivered to you through

TIN LINED IRON PIPE.

In making this pipe we use a block tin of sufficient weight and thickness, placed inside of an iron pipe capable of standing any amount of pressure. The tin pipe is turned over the end of the iron, and all fittings lined so as to give, when coupled, a continuous tin pipe capable of being bent and coupled with all the ease and security of any iron pipe, and without the possibility of the iron becoming exposed to the action of the water. THE MOST PRACTICAL AND ECONOMICAL SANITARY WATER PIPE MADE. Costs about the same as lead pipe, one-third as much as block tin, and two-thirds as much as tin lined lead.

For more particular information, prices, etc., inquire of

LEAD LINED IRON PIPE COMPANY,

WAKEFIELD, MASS.

Manufacturers of Lead and Tin Lined Iron Pipe.

ARTHUR L. HERSUM

27 Province Street, Boston

Telephone 1450

Sanitary Plumber

Drainage and Ventilation

A SPECIALTY

All orders promptly attended to

BRANCH OFFICE

KENDAL GREEN, WESTON, MASS.

D. WHITING & SONS,

Dealers in Wholesale and Retail.

MILK AND BUTTER.

PASTEURIZED MILK
AND CREAM FURNISHED UPON NOTICE.

472 RUTHERFORD AVENUE,
BOSTON, MASS.

BOSTON DAIRY CO.

MILK CONTRACTORS

MANUFACTURERS OF

FINE BUTTER AND CHEESE

111 AUSTIN STREET

CHARLESTOWN, MASS.

The FUTURE OF THE AMERICAN NEGRO

By

BOOKER T. WASHINGTON

PRINCIPAL OF TUSKEGEE NORMAL AND INDUSTRIAL INSTITUTE

Cloth, decorative
4⅞ x 7⅝ inches

PRICE, $1.50

Photogravure
Frontispiece

IN this book Mr. Washington takes up briefly the history of the Negro race in America, its present condition, and its outlook for the future. The whole subject is presented with such sympathy, such breadth of vision, such fairness and candor, and yet with so much forcefulness, as will increase the already great reputation of the author. The first chapters deal with the proper and most practical education of the Negro, illustrated by a detailed exposition of the principles on which education at Tuskegee, and similar institutions, is based. The chapters which follow deal with the Negro in politics; lynching; the weakness and strength of the Negro; and the Negro's place in American civilization. Not the least admirable quality of the book is its essential hopefulness. It is distinctly a volume which no one interested in the solution of this great and most vital American problem can afford to leave unread.

"Every one who reads the publication . . . will be impressed with the brains which underlie the sober judgment of the writer."— *Atlanta Constitution.*

"A work that should command the attention of every person interested in the future conditions of the United States."— *Philadelphia Inquirer.*

"He is doing for the race more than all its bishops."— *Florida Times-Union.*

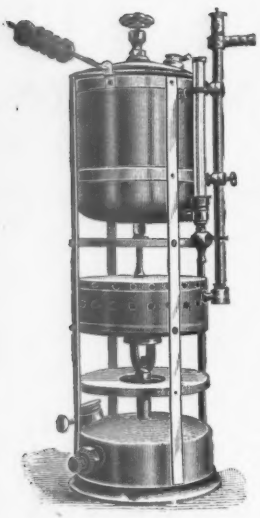
"Candid, dispassionate, and practical."— *Living Age.*

"Nothing hitherto published is equal to it, and it will be a long time, we think, before any book on this subject will displace it."— *New York Commercial Advertiser.*

FOR SALE by all booksellers or sent postpaid, on receipt of price, by the publishers.

SMALL, MAYNARD & COMPANY

PIERCE BUILDING BOSTON, U.S.A.



The Sanitary . . .
Formaldehyde Regenerator

with its recent improvements is the best and most reliable. Utilizes the commercial solution exclusively. Adopted by the Health Department of New York City, the Health Officer of the Port of New York, Pennsylvania State Quarantine Board, Florida State Board of Health, and the Health Authorities of Boston, Baltimore, Washington, Milwaukee, New Haven, Albany, Rochester, Newark, Montreal, and all leading cities.

Formaldehyde and Steam Disinfecting Chambers. Household Garbage Carbonizers.

Brochure on disinfection and details of work done with this apparatus supplied upon request by

THE SANITARY CONSTRUCTION CO.,
56 and 58 Pine Street, New York.

Our productions are also for sale by

MELVIN & BADGER,
43 Temple Place, Boston, Mass.

The Morse-Boulger Garbage Destructor.

An improved furnace for the disposal of every class of organic waste: Garbage, Night-soil, Sewage Sludge, Stable Refuse, Factory Waste, and Bodies of Animals.

Specially built for any location and for the particular kind of matter to be destroyed. Durable, economical, sanitary, and utilizing the heat for steam power.

The Morse-Boulger Refuse Destructor.

Specially designed, with accompanying machinery, for the utilization of city refuse and the production of steam power for any purpose required.

The Hospital Destructor.

For use in Public Institutions, Medical Schools, Hospitals, Hotels, Department Stores, Factories, and Dwellings, destroying every kind of dangerous and worthless matter on the premises with rapidity and freedom from nuisance.

Steam Sterilization Machinery.

The latest and most approved type. Moderate in cost and effective in operation, including the best apparatus for production and use of Formaldehyde Gas.

Examination and surveys made; plans and estimates, with rights for patented inventions, furnished. Contracts or superintendence undertaken for all Sanitary Engineering Work in connection with Waste Disposal and Steam Sterilization. Address W. F. MORSE, 287 Fourth Avenue, New York City.

WOMEN AND ECONOMICS.

A Study of the Economic Relation between Men and Women as a Factor in Social Evolution.

BY CHARLOTTE PERKINS STETSON.

A Few of the Very Many Divisions of the Subject: — Proem, preface, economic environment, the dependence of women, women's labor not their own, no inherent disability of sex, marriage not a partnership, house service as a livelihood, women as mothers, modification to maternity, motherhood and economic production, the usefulness of sex, differentiation of sex, sex and humanity, altering the balance of forces, excessive modification, the eternal feminine, unreasoning devotion, women as persons, race-attributes and sex-attributes, the normal child, food and defence, personal profit and sex relations, reducing the area of environment,

the increasing difficulty of marriage,

the influence of heredity, the young man and the young woman, women and human growth, the effect of custom, personalizing and generalizing, the sex relation personal, innocence and ignorance, the delicacy of woman's position, marriage and independence, a sin against nature, wealth a social product, a counter-force, supporting one's family, virtue and vice, choosing the winner, getting things and doing things, marriage without purchase, the results of repression, the harm that women do, common interest and common consciousness, the development of love, the maternalizing of man, union of male and female qualities, Israel and Egypt,

the evolution of male equality,

the meaning of the sacrifice, the menace of present conditions, the hope for the future, the martyr and the pioneer, the dropping of the bars, the meaning of the new woman, the women workers, functions and femininity, women and social interests, women and the church, maternity and economic advantage, the specialized sex, the center of reverence, the measure of right motherhood, motherhood and racial advance, "the gates of death," "the maternal sacrifice," the untrained sex, marriage and the family distinct, society *vs.* the home, cooking as a profession,

socializing the household industries,

women and the food supply, the heart and the stomach, the need of expert service, the stomach as a family tie, practising on the family, aggregate privacy, home life in town and country, the tyranny of bric-a-brac, the servant-wife, world-servants and house-servants, discomfort and uneasiness, the growth of loyalty, a baby's impressions, the loosening of tradition, planning for character, a wider maternity, a broader relationship, marriage without housekeeping, knowing one's children, the strain on personality, the isolation of women, a race of psychic hybrids.

Cloth, 12mo, 340 pages. Price, $1.50.

At all bookstores, or will be sent, postpaid, on receipt of price, by the publishers,

SMALL, MAYNARD & COMPANY,

PIERCE BUILDING, COPLEY SQUARE, BOSTON.

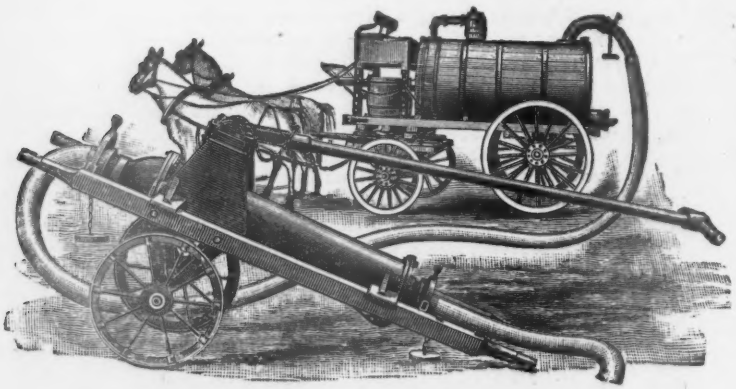
Health Department, City of Boston.

I hereby certify that the "Odorless Excavating Apparatus," known as such and manufactured by The Odorless Excavating Company, was introduced by said company in this city in 1874, on the approval of the Boston Board of Health.

All work of cleaning vaults and certain cesspools in this city has been done by the said company with said apparatus and to the satisfaction of said Board of Health.

The Board of Health,

(Signed) S. H. DURGIN, Chairman.



THE ODORLESS EXCAVATING CO.,

ESTABLISHED 1859.

MANUFACTURERS OF THE MOST IMPROVED

ODORLESS PUMPS AND APPARATUS.

Cities, Towns, and Corporations
Furnished with Complete Outfit for Odorless Excavation.

TO THE ODORLESS EXCAVATING CO.,
64 Federal Street, Boston, Mass.

Gentlemen,— We are now using your apparatus for cleaning vaults and cesspools, and think it the best we have ever seen.

We have used several different kinds of pumps, but never have found one that gives as good satisfaction as yours.

Would not hesitate to recommend it to any parties desiring to use anything of this kind.

Yours respectfully,

(Signed) CHARLES H. CARY,
Secretary Board of Health, Brockton, Mass.

Price List and Catalogue on application.

64 Federal Street, - Boston, Mass.

The Barber Asphalt Paving Co.

TRINIDAD LAKE ASPHALT

For Streets, Driveways, Sidewalks, and Floors.

CLEAN, HEALTHY, DURABLE.

Artificial Stone Floors and Sidewalks.

ASPHALT WATER-PROOFING

For Brick, Stone, and Concrete Masonry.

68 Mason Building, 70 Kilby Street, Boston.

TELEPHONE, BOSTON 2624.

W. A. MURTFELDT COMPANY

Use the best imported

Rock Asphalt Floors

BEST SANITARY FLOOR IN USE

ARTIFICIAL STONE FLOORS and WALKS

Watertight Cellars

Floors and Walls made Damp Proof

192 DEVONSHIRE STREET, BOSTON

Deerfoot Farm Milk

IN GLASS JARS

OUR FAMILY MILK — coming from three great farms — is principally from Jerseys and their grades. The cows are daily exercised and fed generously with clover hay, corn fodder, and grain. Unlike the old-fashioned barn, where the manure is stored underneath and the hay overhead, the barns of Deerfoot Farm, Southboro, Mass., are well appointed and have ample ventilation, the feed being stored away from the cows, and the manure placed in a separate building a distance away.

It is under these conditions that our cows, with a good supply of pure water, carefully selected food, and good treatment, produce milk which has made Deerfoot Farm famous. Every day the apparatus at the dairy is not only boiled, but sterilized, to insure perfect cleanliness.

After being aërated and bottled, the milk is shipped from the dairy at 9 P.M., arriving in Boston at 2 A.M., and is delivered at **Back Bay, Brookline,** and **Cambridge residences** in our patent bottle, here illustrated, in time for breakfast.

No formalin, salicylic, or boracic acid used in any of the Deerfoot Farm Products.

DEERFOOT FARM

29 Bromfield Street, Boston

Telephone, 2289 Boston **Send for Booklet Free**